

## CLAIMS

1. A gas oil fraction hydrotreatment process characterized by using a hydrorefined petroleum-based hydrocarbon oil with a sulfur content of 5-15 ppm by mass, a total aromatic content of 10-25 % by volume and a boiling point range of 150-380°C as the feed oil and  
5     subjecting said feed oil to hydrotreatment in the presence of a hydrogenation catalyst to obtain an ultralow sulfur and low aromatic gas oil fraction having a sulfur content of not greater than 1 ppm by mass and a total aromatic content of not greater than 1 % by volume.

10     2. A gas oil fraction hydrotreatment process according to claim 1, characterized in that said feed oil has a monocyclic aromatic content of 9-18 % by volume and a bicyclic or greater aromatic content of 1-7 % by volume, and said ultralow sulfur and low aromatic gas oil fraction  
15     has a bicyclic or greater aromatic content of not greater than 0.2 % by volume.

3. A gas oil fraction hydrotreatment process according to claim 1 or 2, characterized in that the reaction conditions for said hydrotreatment are a reaction temperature of 170-320°C, a hydrogen partial pressure of 2-10 MPa, a liquid hourly space velocity of 0.1-2 h<sup>-1</sup>  
20     and a hydrogen/oil ratio of 100-800 NL/L.

4. A gas oil fraction hydrotreatment process according to any one of claims 1 to 3, characterized in that said feed oil has a paraffin content of 30-60 % by volume and a naphthene content of 25-60 % by volume, while said ultralow sulfur and low aromatic gas oil fraction  
25     has a paraffin content of 30-60 % by volume and a naphthene content of 40-70 % by volume.

5. A gas oil fraction hydrotreatment process according to any one of claims 1 to 4, characterized in that said hydrogenation catalyst is one having at least one kind of active metal from among Group 8 metals supported on a porous support.

5           6. A gas oil fraction hydrotreatment process according to claim 5, characterized in that said porous support is composed of alumina and at least one substance selected from the group consisting of titania, zirconia, boria, silica, phosphorus and zeolite.

10           7. A gas oil fraction hydrotreatment process according to claim 5 or 6, characterized in that said active metal is at least one kind of metal selected from the group consisting of Ru, Rh, Ir, Pd and Pt.

15           8. An ultralow sulfur and low aromatic gas oil fraction having a sulfur content of not greater than 1 ppm by mass and a total aromatic content of not greater than 1 % by volume, characterized by being obtained by a process according to any one of claims 1 to 7.

20           9. A gas oil composition characterized by comprising an ultralow sulfur and low aromatic gas oil fraction having a sulfur content of not greater than 1 ppm by mass and a total aromatic content of not greater than 1 % by volume, and obtained by a process according to any one of claims 1 to 7.